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eTable 1. International Classification of Diseases codes used for data extraction of diagnoses examined in this study, and age at onset cut-offs and sample sizes used in the sensitivity analysis.

Diagnosis	ICD-10-SE	ICD-9-SE	ICD-8-SE	Age at Onset (years) Cut-Offs ^a	No. (%) Observation Excluded from Sensitivity Analysis
Mental					
ASD	F84	299	-	1	128976 (1.5) for ASD without ID; 35487 (0.4) for ASD with ID
ID	F70-79	317-319	310-315	0	4671 (0.1)
ADHD	F90	314	-	3	208240 (2.4)
Other Childhood Disorders	F80-83, 88, 89, 90-98	307.0, 307.6, 312-316	306.0-306.3, 308	0	21736 (0.3)
Alcohol Misuse	F10	291, 303, 305A	291, 303	13	1226129 (14.2)
Drug Misuse	F11-16, 18-19	292, 304, 305.C-305.X	294, 304	2	44751 (0.5)
NAPD	F20-29	295, 297, 298	295, 297, 298.3, 298.9, 299	8	629479 (7.3)
Bipolar Disorder	F30-31	296 (all except 296.2 and 296.3)	296	10	865869 (10.0)
Depression	F32-39	296.2, 296.3, 300.4, 311	300.4	11	997887 (11.5)
Anxiety Disorders	F40-41	300.0, 300.2	300.0, 300.2	6	417526 (4.8)
OCD	F42	300.3	300.3	6	421334 (4.9)
Stress Related Disorders	F43	308-309	-	3	215201 (2.5)
Other Neurotic Disorders	F44-48	300.1, 300.8, 306, 307.8	300.1, 300.5-300.7, 305	1	47527 (0.6)
Eating Disorder	F50	307.B, 307.F	306.5	12 ^b	1118150 (12.9)
Personality Disorder	F60-69	301	301	7	516483 (6.0)
Neurologic					
Cerebral Palsy	G80	343	343	0	24406 (0.3)
Epilepsy	G40-41	345	345	0	15476 (0.2)
Multiple Sclerosis	G35	340	340	14	1349655 (15.6)
Migraine	G43	346	346	4	224213 (2.6)
Dementia	F00-03	290A, 331A, 290E/W/X	290.00, 290.10, 293	24 ^c	2715016 (31.4)
Stroke	G45, I60-61, I63-I64, I69	430, 431, 434-438	430-431, 433-434	3	129578 (1.5)
Parkinson's Disease	G20	332.0	342	29	3336939 (38.6)

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ICD: International Classification of Diseases; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder.

a. All age at onset cut-offs were set at the 0.5th percentile (i.e., a lower bound) of age at diagnosis for each disorder in the study sample unless noted in the footnotes below.

b. The 20th percentile of age at onset was used as the cut-off for eating disorder.

c. The 5th percentile of age at onset was used as the cut-off for dementia.

eTable 2a. Prevalence (per 1,000) of mental and neurologic disorders in families with index persons affected vs. unaffected by autism spectrum disorders.

Diagnosis	IP	IP	GS 50% Relatives		GS 25% Relatives		GS 12.5% Relatives		GS 6.25% Relatives	
	IP with ASD	IP without ASD	IP with ASD	IP without ASD	IP with ASD	IP without ASD	IP with ASD	IP without ASD	IP with ASD	IP without ASD
Mental										
ASD	1000.0	0.0	132.6	20.6	47.4	19.1	103.1	64.8	72.1	55.6
ID	235.0	6.8	51.6	15.2	35.1	22.3	63.9	46.9	48.2	36.7
ADHD	411.1	26.4	158.8	44.2	85.5	47.0	177.4	126.6	146.9	127.7
Other Childhood Disorders	598.1	83.4	240.8	112.5	128.9	78.9	308.2	261.8	254.0	219.2
Alcohol Misuse	30.1	20.3	118.7	82.8	276.5	243.0	175.2	141.8	114.7	102.5
Drug Misuse	29.0	9.7	70.1	41.1	124.4	95.0	107.9	82.3	67.5	64.5
NAPD	19.8	1.8	37.9	19.7	104.4	82.1	41.7	30.4	19.0	17.9
Bipolar Disorder	16.9	2.4	41.8	20.3	85.1	66.3	35.8	30.0	25.5	19.5
Depression	125.4	29.1	395.4	241.1	482.3	424.9	282.3	233.0	194.5	162.4
Anxiety Disorders	142.4	35.0	292.3	185.6	334.2	290.6	265.8	219.0	183.1	161.4
OCD	41.9	3.6	23.4	11.8	24.5	18.1	31.3	27.6	21.2	19.8
Stress Related Disorders	59.0	21.3	338.7	217.9	305.8	271.6	211.7	172.1	138.7	119.4
Other Neurotic Disorders	14.1	3.9	48.8	30.5	88.3	74.1	44.8	35.2	28.2	23.4
Eating Disorder	30.2	11.7	34.9	25.5	31.7	27.0	77.5	62.5	52.5	45.7
Personality Disorder	28.5	4.3	86.8	35.0	104.6	75.3	80.2	58.4	61.0	45.0
Neurologic										
Cerebral Palsy	16.4	2.4	7.3	4.5	11.6	11.0	16.9	16.2	15.6	12.0
Epilepsy	70.9	8.1	46.9	32.0	137.9	119.0	68.8	64.0	57.1	46.3
Multiple Sclerosis	0.3	0.2	7.7	6.6	20.2	20.0	6.9	5.6	3.7	3.2
Migraine	23.4	17.7	121.8	97.3	141.3	127.4	119.8	106.3	81.0	73.6
Dementia	11.7	6.1	7.3	8.1	751.9	727.4	117.7	92.5	45.7	39.4
Stroke	1.5	0.8	0.8	1.3	400.9	385.0	26.6	22.2	11.7	8.7
Parkinson's Disease	0.0	0.0	0.1	0.0	38.9	38.6	1.3	0.6	0.9	0.2

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; GS: genetic similarity; IP: index person; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder.

eTable 2b. Prevalence (per 1,000) of mental and neurologic disorders in families with index persons affected by autism spectrum disorders with and without intellectual disability.

Diagnosis	IP	IP	GS 50% Relatives		GS 25% Relatives		GS 12.5% Relatives		GS 6.25% Relatives	
	IP with ASD without ID	IP with ASD with ID	IP with ASD without ID	IP with ASD with ID	IP with ASD without ID	IP with ASD with ID	IP with ASD without ID	IP with ASD with ID	IP with ASD without ID	IP with ASD with ID
Mental										
ASD	1000.0	1000.0	131.4	136.4	48.0	45.1	104.2	98.9	74.7	61.5
ID	0.0	1000.0	33.4	110.7	31.7	47.4	64.7	60.9	49.4	43.1
ADHD	434.8	334.0	166.0	135.2	89.3	72.2	179.2	170.7	150.6	132.3
Other Childhood Disorders	583.1	646.9	241.3	238.9	131.6	119.1	308.0	309.2	262.8	218.5
Alcohol Misuse	34.8	14.8	121.5	109.5	283.9	250.0	172.3	186.4	108.8	138.5
Drug Misuse	33.5	14.4	72.1	63.9	128.4	110.1	105.7	116.3	65.1	76.9
NAPD	20.5	17.5	35.9	44.4	105.2	101.5	41.6	42.4	19.2	18.5
Bipolar Disorder	20.3	5.8	44.4	33.1	87.8	75.4	36.5	33.2	25.3	26.2
Depression	146.8	55.7	411.5	342.9	491.3	449.9	281.1	287.0	192.7	201.5
Anxiety Disorders	160.3	84.2	298.5	272.0	339.7	314.5	263.9	273.4	184.7	176.9
OCD	45.1	31.6	23.1	24.2	24.2	25.3	31.6	29.9	22.6	15.4
Stress Related Disorders	65.0	39.4	352.9	292.7	311.4	285.6	210.3	217.4	139.5	135.4
Other Neurotic Disorders	14.5	12.9	48.1	51.1	89.3	84.8	42.7.0	52.7	26.8	33.8
Eating Disorder	33.6	19.1	37.2	27.3	34.0	23.5	74.9	87.5	50.6	60.0
Personality Disorder	32.6	15.2	89.3	78.7	107.2	95.2	79.9	81.0	61.7	58.5
Neurologic										
Cerebral Palsy	5.3	52.6	6.3	10.5	10.7	14.9	18.3	11.4	16.1	13.8
Epilepsy	33.9	191.3	41.2	65.5	139.3	133.1	69.3	66.8	52.1	76.9
Multiple Sclerosis	0.0	1.2	8.4	5.5	21.2	16.7	6.9	7.1	3.8	3.1
Migraine	26.1	14.8	122.5	119.6	145.1	127.7	120.0	119.0	77.0	96.9
Dementia	9.7	18.3	140.2	176.5	758.9	727.0	113.4	134.2	42.9	56.9
Stroke	1.2	2.3	31.4	35.9	395.8	419.2	25.1	32.6	12.3	9.2
Parkinson's Disease	0.0	0.0	2.3	2.3	38.8	39.3	1.3	1.6	0.8	1.5

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; GS: genetic similarity; IP: index person; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder.

eTable 3. Benjamini-Hochberg adjusted *p*-values associated with odds ratios in Table 2.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
GS ^b	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
Mental								
ASD without ID	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	3.68 $\times 10^{-3}$	1.84 $\times 10^{-15}$	6.33 $\times 10^{-10}$	7.12 $\times 10^{-7}$	0.81
ASD with ID	8.10 $\times 10^{-16}$	6.87 $\times 10^{-7}$	4.51 $\times 10^{-6}$	0.29	1.84 $\times 10^{-15}$	2.17 $\times 10^{-5}$	0.01	0.63
ID	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	7.89 $\times 10^{-3}$	1.84 $\times 10^{-15}$	3.05 $\times 10^{-7}$	3.24 $\times 10^{-12}$	0.77
ADHD	8.10 $\times 10^{-16}$	2.89 $\times 10^{-5}$	4.93 $\times 10^{-12}$	2.81 $\times 10^{-4}$	1.84 $\times 10^{-15}$	1.84 $\times 10^{-15}$	0.02	0.49
Other Childhood Disorders	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	4.49 $\times 10^{-6}$	1.84 $\times 10^{-15}$	1.01 $\times 10^{-11}$	3.64 $\times 10^{-11}$	0.65
Alcohol Misuse	8.10 $\times 10^{-16}$	1.85 $\times 10^{-15}$	2.69 $\times 10^{-6}$	0.39	2.29 $\times 10^{-3}$	0.05	6.21 $\times 10^{-3}$	0.07
Drug Misuse	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	1.56 $\times 10^{-4}$	0.93	4.45 $\times 10^{-5}$	2.89 $\times 10^{-3}$	6.21 $\times 10^{-3}$	0.48
NAPD	8.10 $\times 10^{-16}$	1.08 $\times 10^{-11}$	3.68 $\times 10^{-3}$	0.87	7.08 $\times 10^{-12}$	0.02	0.32	0.71
Bipolar Disorder	8.10 $\times 10^{-16}$	4.92 $\times 10^{-11}$	0.13	0.08	4.29 $\times 10^{-3}$	0.07	0.42	0.83
Depression	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	3.12 $\times 10^{-11}$	1.38 $\times 10^{-4}$	1.84 $\times 10^{-15}$	1.60 $\times 10^{-7}$	0.01	0.75
Anxiety Disorders	8.10 $\times 10^{-16}$	9.78 $\times 10^{-14}$	3.08 $\times 10^{-11}$	3.92 $\times 10^{-3}$	1.84 $\times 10^{-15}$	8.76 $\times 10^{-6}$	0.04	0.71
OCD	8.10 $\times 10^{-16}$	4.06 $\times 10^{-4}$	0.25	0.35	1.36 $\times 10^{-5}$	6.21 $\times 10^{-3}$	0.75	0.20
Stress Related Disorders	8.10 $\times 10^{-16}$	6.89 $\times 10^{-9}$	8.78 $\times 10^{-7}$	0.06	1.84 $\times 10^{-15}$	2.67 $\times 10^{-4}$	0.02	0.73
Other Neurotic Disorders	8.10 $\times 10^{-16}$	8.03 $\times 10^{-5}$	0.17	0.47	7.68 $\times 10^{-6}$	0.04	0.02	0.65
Eating Disorder	2.18 $\times 10^{-11}$	4.42 $\times 10^{-3}$	3.12 $\times 10^{-3}$	0.59	0.89	0.65	0.01	0.65
Personality Disorder	8.10 $\times 10^{-16}$	8.10 $\times 10^{-16}$	1.14 $\times 10^{-6}$	1.22 $\times 10^{-4}$	1.84 $\times 10^{-15}$	3.13 $\times 10^{-4}$	0.07	0.64
Neurologic								
Cerebral Palsy	9.68 $\times 10^{-3}$	0.63	0.26	0.18	1.44 $\times 10^{-3}$	0.16	0.07	0.92
Epilepsy	6.99 $\times 10^{-6}$	1.80 $\times 10^{-5}$	0.29	0.22	1.84 $\times 10^{-15}$	0.02	0.65	0.02
Multiple Sclerosis	0.07	0.80	0.73	0.63	0.68	0.62	0.87	0.73
Migraine	8.10 $\times 10^{-16}$	8.18 $\times 10^{-4}$	0.15	0.96	0.02	0.34	0.74	0.47
Dementia	0.04	1.31 $\times 10^{-11}$	0.11	0.63	0.62	1.00 $\times 10^{-5}$	0.04	0.60
Stroke	0.27	0.09	0.52	0.12	0.44	0.01	0.71	0.71
Parkinson's Disease	0.15	0.68	0.22	0.19	-	0.75	0.47	0.31

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; GS: genetic similarity; IP: index person; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder.

eTable 4a. Sensitivity Analysis 1: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, among index persons with both parents born in Sweden.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
GS^b								
Mental								
ASD without ID	8.8 [■]	2.6 [■]	1.7 [■]	1.3 [■]	4.8 [■]	2.6 [■]	1.5 [■]	1.0
ASD with ID	4.1 [■]	2.2 [■]	1.6 [■]	1.2	16.8 [■]	3.0 [■]	1.5	0.7
ID	2.5 [■]	1.4 [■]	1.5 [■]	1.4 [■]	9.2 [■]	2.5 [■]	1.2	1.2
ADHD	4.7 [■]	1.9 [■]	1.5 [■]	1.2 [■]	3.8 [■]	1.8 [■]	1.5 [■]	1.0
Other Childhood Disorders	3.0 [■]	1.7 [■]	1.3 [■]	1.2 [■]	2.9 [■]	1.7 [■]	1.3 [■]	1.0
Alcohol Misuse	1.4 [■]	1.2 [■]	1.2 [■]	1.0	1.4 [■]	1.1 [■]	1.2 [■]	1.2
Drug Misuse	1.9 [■]	1.3 [■]	1.2 [■]	1.0	1.5 [■]	1.3 [■]	1.2 [■]	1.0
NAPD	1.9 [■]	1.3 [■]	1.2 [■]	1.0	1.9 [■]	1.2	1.1	0.7
Bipolar Disorder	2.3 [■]	1.3 [■]	1.1	1.3	1.5 [■]	1.2	0.8	0.9
Depression	2.2 [■]	1.2 [■]	1.1 [■]	1.2 [■]	1.6 [■]	1.2 [■]	1.1 [■]	0.9
Anxiety Disorders	1.9 [■]	1.2 [■]	1.1 [■]	1.2 [■]	1.5 [■]	1.2 [■]	1.1	1.0
OCD	2.1 [■]	1.2	1.1	1.2	2.2 [■]	1.5 [■]	0.9	0.6
Stress Related Disorders	1.9 [■]	1.2 [■]	1.1 [■]	1.1	1.5 [■]	1.2 [■]	1.1 [■]	0.9
Other Neurotic Disorders	1.7 [■]	1.2 [■]	1.1	1.1	2.0 [■]	1.2	1.3 [■]	1.2
Eating Disorder	1.5 [■]	1.2 [■]	1.1 [■]	1.1	1.1	0.9	1.3 [■]	1.1
Personality Disorder	2.9 [■]	1.4 [■]	1.5 [■]	1.4 [■]	2.7 [■]	1.3 [■]	1.1	1.1
Neurologic								
Cerebral Palsy	1.4	0.9	1.2	1.2	2.9 [■]	1.4	0.7	1.1
Epilepsy	1.3 [■]	1.2 [■]	1.1	1.1	2.1 [■]	1.2 [■]	1.0	1.3 [■]
Multiple Sclerosis	1.3	1.0	1.0	1.1	1.0	1.0	1.0	0.8
Migraine	1.4 [■]	1.2 [■]	1.1	1.0	1.1	1.2 [■]	1.0	1.1
Dementia	0.8	1.1 [■]	1.1	1.0	1.3	1.1 [■]	1.1	1.2
Stroke	0.7	1.0	1.0	1.4	0.5	1.1	1.1	0.6
Parkinson's Disease	- ^c	1.0	1.8	2.7	- ^c	0.9	2.2	- ^c

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with [■], [■], and [■], respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins

c. OR could not be estimated due to low event rate.

eTable 4b. Sensitivity Analysis 1: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, among index persons with at least one parent not born in Sweden.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
GS ^b	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
Mental								
ASD without ID	9.2 [■]	2.4 [■]	1.9 [■]	1.2	3.6 [■]	1.7	1.6	1.5
ASD with ID	3.7 [■]	1.6	1.2	1.1	10.8 [■]	2.4	1.7	0.8
ID	2.1 [■]	1.3	1.2	1.2	5.7 [■]	2.0 [■]	1.3	0.9
ADHD	4.3 [■]	1.9 [■]	1.5 [■]	1.0	2.8 [■]	1.1	1.3	1.1
Other Childhood Disorders	2.6 [■]	1.6 [■]	1.2 [■]	1.1	2.3 [■]	1.2	1.2	0.9
Alcohol Misuse	1.7 [■]	1.1	1.1	1.1	1.0	0.9	1.1	1.4
Drug Misuse	1.6 [■]	1.3 [■]	1.1	1.0	1.3	1.0	1.2	1.9
NAPD	1.9 [■]	1.1	1.0	0.9	1.9 [■]	1.2	1.4	1.7
Bipolar Disorder	2.2 [■]	1.3 [■]	1.2	1.3	1.4	1.1	1.2	1.8
Depression	1.8 [■]	1.1	1.2 [·]	1.1	1.2 [■]	1.1	1.0	1.7
Anxiety Disorders	1.6 [■]	1.0	1.2 [■]	1.0 [■]	1.3 [■]	1.0	1.1	0.9
OCD	1.9 [■]	1.8 [■]	1.1	0.8	1.6	1.6	1.0	1.0
Stress Related Disorders	1.7 [■]	1.0	1.2 [·]	1.1	1.2 [■]	1.1	1.1	1.4
Other Neurotic Disorders	1.6 [■]	1.1	1.1	1.1	1.1	1.1	1.3	0.7
Eating Disorder	1.5 [■]	1.1	1.3	0.9	0.9	0.9	1.2	0.9
Personality Disorder	2.2 [■]	1.3 [■]	1.2	1.3	1.4	1.2	1.3	0.9
Neurologic								
Cerebral Palsy	1.7	1.2	0.9	1.5	1.4	1.3	0.4	- ^c
Epilepsy	1.3 [·]	1.1	1.0	1.5	1.9 [■]	1.2	0.7	2.5
Multiple Sclerosis	1.3	0.9	1.6	2.1	0.6	0.6	1.5	- ^c
Migraine	1.2 [■]	0.9	0.9	1.1	1.2	0.8	1.0	1.2
Dementia	0.6	1.1	1.0	1.5	1.0	1.1	1.2	1.0
Stroke	0.4	1.1 [·]	0.8	1.0	0.6	1.2	1.1	2.0
Parkinson's Disease	- ^c	1.0	1.2	5.4	- ^c	1.2	- ^c	- ^c

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with [■], [■], and [·], respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins

c. OR could not be estimated due to low event rate.

eTable 5. Sensitivity Analysis 2: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, based on data accounted for potential immortal time bias.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
GS ^b	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
Mental								
ASD without ID	9.0 [■]	2.5 [■]	1.8 [■]	1.3 [■]	4.1 [■]	2.3 [■]	1.5 [■]	1.0
ASD with ID	3.8 [■]	2.0 [■]	1.5 [■]	1.2	14.2 [■]	2.8 [■]	1.6 [·]	0.8
ID	2.3 [■]	1.3 [■]	1.4 [■]	1.4	7.6 [■]	2.4 [■]	1.3 [·]	1.2
ADHD	4.7 [■]	1.9 [■]	1.5 [■]	1.1 [■]	3.3 [■]	1.6 [■]	1.5 [■]	1.0
Other Childhood Disorders	2.9 [■]	1.7 [■]	1.3 [■]	1.2 [■]	2.6 [■]	1.6 [■]	1.3 [■]	1.0
Alcohol Misuse	1.5 [■]	1.2 [■]	1.1 [■]	1.1	1.2 [■]	1.1 [·]	1.2 [■]	1.2
Drug Misuse	1.8 [■]	1.3 [■]	1.1	1.0	1.4 [■]	1.2 [■]	1.2 [■]	1.1
NAPD	1.9 [■]	1.3 [■]	1.2 [■]	1.0	2.1 [■]	1.2 [·]	1.2	0.9
Bipolar Disorder	2.2 [■]	1.3 [■]	1.1	1.3	1.4 [■]	1.2	0.9	1.1
Depression	2.0 [■]	1.2 [■]	1.2 [■]	1.2	1.4 [■]	1.2 [■]	1.1 [·]	1.0
Anxiety Disorders	1.8 [■]	1.2 [■]	1.2 [■]	1.1 [■]	1.4 [■]	1.2 [■]	1.1 [·]	1.0
OCD	2.1 [■]	1.3	1.1	1.1	1.9 [■]	1.5 [■]	1.0	0.6
Stress Related Disorders	1.8 [■]	1.1 [■]	1.1 [■]	1.1	1.4 [■]	1.2	1.1 [·]	1.0
Other Neurotic Disorders	1.6 [■]	1.2 [■]	1.1	1.1	1.6 [■]	1.2 [·]	1.3 [·]	1.1
Eating Disorder	1.5 [■]	1.2	1.1 [·]	1.0	1.0	0.9	1.3 [·]	1.1
Personality Disorder	2.6 [■]	1.4 [■]	1.2 [■]	1.4	2.1 [■]	1.3	1.2	1.1
Neurologic								
Cerebral Palsy	1.5 [■]	0.9	1.1	1.3	2.2 [■]	1.4	0.7	1.0
Epilepsy	1.3 [■]	1.1 [■]	1.1	1.1	2.0 [■]	1.2 [·]	0.9	1.5 [·]
Multiple Sclerosis	1.3	1.0	1.1	1.2	0.9	0.9	1.1	0.7
Migraine	1.3 [■]	1.1	1.1	1.0	1.2 [·]	1.1	1.0	1.1
Dementia	0.7	1.1 [■]	1.1	1.2	1.4 [■]	1.1	1.1	1.1
Stroke	0.6	1.0	1.0	1.2	0.6	1.1 [·]	1.2	0.8
Parkinson's Disease	- ^c	1.0	1.7	3.8	- ^c	1.0	1.9	5.3

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with [■], [▪], and [·], respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins.

c. OR could not be estimated due to low event rate.

eTable 6. Sensitivity Analysis 3: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, adjusting for relative's autism spectrum disorders status.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
GS ^b								
Mental								
ID	0.7 [■]	1.1	1.2 [■]	1.3 [■]	3.9 [■]	2.0 [■]	1.1	1.2
ADHD	3.0 [■]	1.7 [■]	1.4 [■]	1.1	2.0 [■]	1.3 [■]	1.4 [■]	1.0
Other Childhood Disorders	2.1 [■]	1.5 [■]	1.2 [■]	1.2 [■]	1.9 [■]	1.4 [■]	1.2 [■]	1.0
Alcohol Misuse	1.5 [■]	1.2 [■]	1.1 [■]	1.1	1.2 [·]	1.1	1.2 [·]	1.2
Drug Misuse	1.7 [■]	1.3 [■]	1.1 [■]	1.0	1.3 [■]	1.2 [■]	1.2 [·]	1.1
NAPD	1.6 [■]	1.2 [■]	1.1	1.0	1.8 [■]	1.2	1.1	0.9
Bipolar Disorder	2.0 [■]	1.3 [■]	1.1	1.3	1.3	1.2	0.8	1.1
Depression	1.9 [■]	1.2 [■]	1.1 [■]	1.2 [■]	1.3 [■]	1.2 [■]	1.1	1.0
Anxiety Disorders	1.6 [■]	1.1 [■]	1.1 [■]	1.1 [·]	1.3 [■]	1.2 [■]	1.1	1.0
OCD	1.4 [■]	1.2 [·]	1.0	1.1	1.3	1.4 [·]	0.9	0.6
Stress Related Disorders	1.8 [■]	1.1 [■]	1.1 [■]	1.1	1.3 [■]	1.2 [■]	1.1	1.0
Other Neurotic Disorders	1.5 [■]	1.2 [■]	1.1	1.1	1.5 [■]	1.2	1.3 [·]	1.1
Eating Disorder	1.4 [■]	1.2	1.1 [·]	1.0	0.9	0.9	1.2 [·]	1.1
Personality Disorder	2.2 [■]	1.3 [■]	1.2 [■]	1.4 [■]	1.8 [■]	1.3 [■]	1.1	1.1
Neurologic								
Cerebral Palsy	1.1	0.9	1.1	1.3	1.6	1.3	0.6	1.0
Epilepsy	1.0	1.1 [■]	1.0	1.1	1.6 [■]	1.1 [·]	0.9	1.5 [·]
Multiple Sclerosis	1.3	1.0	1.1	1.2	0.9	0.9	1.1	0.7
Migraine	1.3 [■]	1.1 [■]	1.1	1.0	1.2 [·]	1.1	1.0	1.1
Dementia	0.7 [·]	1.1 [■]	1.1	1.2	1.4	1.1 [■]	1.1	1.1
Stroke	0.6	1.0	1.0	1.2	0.5	1.1 [·]	1.1	0.8
Parkinson's Disease	7.6	0.9	1.8	3.8	- ^c	0.9	1.9	5.3

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with [■], [■], and [·], respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins.

c. OR could not be estimated due to low event rate.

eTable 7a. Sensitivity Analysis 4: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, among index persons born in 1984-1996.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
GS ^b								
Mental								
ASD without ID	8.2 [■]	2.7 [■]	1.7 [■]	1.2	3.7 [■]	2.3 [■]	1.6 [■]	1.0
ASD with ID	3.5 [■]	2.1 [■]	1.2	1.4	12.3 [■]	2.7 [■]	1.4	0.9
ID	2.1 [■]	1.4 [■]	1.3 [■]	1.4 [■]	6.9 [■]	2.2 [■]	1.2	1.3
ADHD	4.0 [■]	1.9 [■]	1.5 [■]	2.1	3.2 [■]	1.6 [■]	1.5 [■]	1.1
Other Childhood Disorders	2.9 [■]	1.8 [■]	1.3 [■]	1.1 [■]	2.6 [■]	1.6 [■]	1.3 [■]	0.9
Alcohol Misuse	1.5 [■]	1.1 [■]	1.1 [■]	1.0	1.2 [·]	1.1	1.1	1.2
Drug Misuse	1.7 [■]	1.2 [■]	1.2 [■]	1.0	1.4 [■]	1.2 [·]	1.2	1.2
NAPD	2.0 [■]	1.3 [■]	1.2 [■]	1.4	2.1 [■]	1.3 [·]	1.2	0.9
Bipolar Disorder	2.1 [■]	1.3 [■]	1.2	1.4 [·]	1.4 [·]	1.2	0.9	1.2
Depression	2.0 [■]	1.2 [■]	1.2 [■]	1.2 [■]	1.4 [■]	1.2 [■]	1.2 [■]	1.0
Anxiety Disorders	1.7 [■]	1.2 [■]	1.1 [■]	1.1 [·]	1.4 [■]	1.2 [■]	1.1 [·]	1.0.
OCD	2.1 [■]	1.3 [·]	1.1	0.8	2.3 [■]	1.8 [■]	1.0	0.5
Stress Related Disorders	1.7 [■]	1.1 [■]	1.1 [■]	1.1	1.3 [■]	1.1	1.2 [■]	0.9
Other Neurotic Disorders	1.5 [■]	1.2 [■]	1.0	1.3	1.7 [■]	1.2	1.4 [■]	1.3
Eating Disorder	1.5 [■]	1.3 [·]	1.1 [·]	1.0	1.2	0.9	1.3 [■]	1.1
Personality Disorder	2.5 [■]	1.3 [■]	1.2 [■]	1.4 [■]	2.1 [■]	1.3 [■]	1.3 [·]	1.2
Neurologic								
Cerebral Palsy	1.8 [■]	1.0	1.2	1.4	2.5 [■]	1.1	0.6	0.5
Epilepsy	1.2 [■]	1.1 [■]	1.0	1.1	2.1 [■]	1.2 [·]	1.0	1.6 [·]
Multiple Sclerosis	1.4	0.9	1.0	1.2	0.8	0.7	1.3	0.9
Migraine	1.3 [■]	1.1	1.0	1.1	1.1	1.2	1.1	1.2
Dementia	0.7	1.0 [·]	1.0	1.1	1.2	1.1 [·]	1.2	1.0
Stroke	0.5	1.0 [·]	0.9	1.3	- ^c	1.1	1.0	0.6
Parkinson's Disease	13.0	0.9	1.5	6.6	- ^c	0.9	2.3	- ^c

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with [■], [■], and [·], respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins

c. OR could not be estimated due to low event rate.

eTable 7b. Sensitivity Analysis 4: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, among index persons born in 1997-2009.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
GS ^b	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
Mental								
ASD without ID	9.0 ■	2.4 ■	1.8 ■	1.4 ■	4.0 ■	2.2 ■	1.4	1.0.
ASD with ID	3.8 ■	2.1 ■	1.7 ■	1.0	15.7 ■	3.2 ■	1.7	0.4
ID	2.3 ■	1.3 ·	1.4 ■	1.4 ·	8.1 ■	2.8 ■	1.3	1.0
ADHD	5.0 ■	2.0 ■	1.5 ■	1.2 ■	2.9 ■	1.5 ·	1.2	0.9
Other Childhood Disorders	2.6 ■	1.7 ■	1.3 ■	1.2 ■	2.3 ■	1.5 ■	1.2 ■	1.0
Alcohol Misuse	1.7 ■	1.2 ■	1.2 ■	1.1	1.4 ·	1.0.	1.3 ·	1.1
Drug Misuse	2.0 ■	1.4 ■	1.1	1.0	1.4	1.2	1.2	1.0
NAPD	1.5 ■	1.2 ■	1.1	1.1	2.0 ■	1.1	0.9	0.7
Bipolar Disorder	2.4 ■	1.3 ■	1.0	1.0	1.6	1.2	0.9	0.6
Depression	2.1 ■	1.2 ■	1.1 ·	1.1	1.4 ■	1.2 ■	1.0	1.0
Anxiety Disorders	1.9 ■	1.1 ■	1.2 ■	1.1	1.4 ■	1.2 ·	1.0	0.9
OCD	2.2 ■	1.4 ■	1.1	1.6 ·	1.3	1.2	0.9	0.8
Stress Related Disorders	1.8 ■	1.2 ■	1.1 ■	1.2	1.4 ■	1.3 ■	0.9	1.0
Other Neurotic Disorders	1.6 ■	1.2 ·	1.2	0.7	1.2	1.1	1.0	0.9
Eating Disorder	1.7 ■	1.2 ·	1.1	1.1	0.7	1.0	1.0	1.0
Personality Disorder	3.0 ■	1.5 ■	1.2 ■	1.3	1.9 ■	1.3	1.0	0.9
Neurologic								
Cerebral Palsy	1.1	0.8	1.0	1.1	1.6	1.8	0.7	2.1
Epilepsy	1.4 ■	1.2 ■	1.1	1.2	2.0 ■	1.1	0.9	1.3
Multiple Sclerosis	1.2	1.2	1.2	1.2	1.0	1.2	0.3	- ^c
Migraine	1.3 ■	1.1 ■	1.1 ·	0.9	1.2	1.0	0.7	1.0
Dementia	0.9	1.1 ■	1.1	1.0	1.3	1.2 ■	1.1	1.5
Stroke	1.1	1.0	1.0	1.6	2.5	1.2 ·	1.3	1.5
Parkinson's Disease	- ^c	- ^c	- ^c	- ^c	- ^c	- ^c	- ^c	- ^c

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with ■, ■, and ·, respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins

c. OR could not be estimated due to low event rate.

eTable 8a. Sensitivity Analysis 5: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, using data from relatives age < 40 years at the end of follow-up.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
GS ^b								
Mental								
ASD without ID	8.1 [■]	2.5 [■]	1.8 [■]	1.3 [■]	3.7 [■]	2.3 [■]	1.5 [■]	1.0
ASD with ID	3.7 [■]	2.1 [■]	1.5 [■]	1.2	13.6 [■]	2.9 [■]	1.4 [·]	0.8
ID	2.2 [■]	1.4 [■]	1.4 [■]	1.4 [■]	7.5 [■]	2.9 [■]	1.3 [·]	1.2
ADHD	2.7 [■]	1.6 [■]	1.3 [■]	1.2 [■]	3.1 [■]	1.6 [■]	1.5 [■]	1.0
Other Childhood Disorders	2.7 [■]	1.6 [■]	1.3 [■]	1.2 [■]	2.4 [■]	1.5 [■]	1.3 [■]	1.0
Alcohol Misuse	1.4 [■]	1.2 [■]	1.2 [■]	1.0	1.0	1.3 [·]	1.1	1.3 [·]
Drug Misuse	1.9 [■]	1.2 [■]	1.1 [■]	1.0	1.3	1.5 [■]	1.1	1.1
NAPD	2.1 [■]	1.2	1.1	0.9	2.0 [■]	1.5	1.1	0.6
Bipolar Disorder	2.6 [■]	1.4 [■]	1.0	1.2	1.7 [·]	1.4	1.0	0.9
Depression	2.2 [■]	1.4 [■]	1.2 [■]	1.2 [■]	1.4 [■]	1.4 [■]	1.1 [■]	1.1
Anxiety Disorders	2.0 [■]	1.2 [■]	1.2 [■]	1.1 [■]	1.4 [■]	1.4 [■]	1.1 [·]	1.0
OCD	2.1 [■]	1.4 [■]	1.1	1.2	2.0 [■]	1.7 [·]	0.9	0.6
Stress Related Disorders	1.9 [■]	1.2 [■]	1.2 [■]	1.1	1.4 [■]	1.3 [■]	1.2 [·]	1.0
Other Neurotic Disorders	1.8 [■]	1.4 [■]	1.1	1.1	1.5 [·]	1.5	1.2	1.3
Eating Disorder	1.4 [■]	1.3 [■]	1.2 [■]	1.0	0.9	1.0	1.2 [·]	1.1
Personality Disorder	2.6 [■]	1.6 [■]	1.3 [■]	1.4 [■]	1.8 [■]	1.5 [■]	1.1	1.1
Neurologic								
Cerebral Palsy	1.6 [■]	1.1	1.1	1.2	2.2 [■]	0.7	0.7	0.9
Epilepsy	1.4 [■]	1.2 [·]	1.0	1.1	2.5 [■]	1.7 [■]	0.9	1.5 [·]
Multiple Sclerosis	1.4	1.2	1.2	1.1	2.2	1.9	1.1	0.6
Migraine	1.4 [■]	1.2 [■]	1.0	1.0	1.1	1.0	1.0	1.2
Dementia	0.7 [·]	1.3 [■]	1.0	1.0	1.1	1.2	1.2	1.4
Stroke	0.7	0.9	0.8	1.4	0.5	1.3	0.7	1.0
Parkinson's Disease	- ^c	- ^c	- ^c	4.2	- ^c	- ^c	- ^c	- ^c

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001, 0.0001 - < 0.01, and 0.01 - < 0.05, were denoted with [■], [■], and [·], respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins

c. OR could not be estimated due to low event rate.

eTable 8b. Sensitivity Analysis 5: Odds ratios comparing risk of autism spectrum disorders with and without intellectual disability in index persons with vs. without a family history of mental and neurologic disorders, using data from relatives age ≥ 40 years at the end of follow-up.

Diagnosis in Relatives	OR of ASD without ID in Index Persons ^a				OR of ASD with ID in Index Persons			
	50%	25%	12.5%	6.25%	50%	25%	12.5%	6.25%
GS ^b								
Mental								
ASD without ID	17.0 ■	2.2 ■	1.5	- ^c	3.7 ■	2.3	1.5	1.0
ASD with ID	3.7	2.1	1.5	1.2	13.6	2.9	1.4 [*]	0.8
ADHD	5.2 ■	1.7 ■	1.5 [■]	1.0	3.1 ■	1.6	1.5	1.0
ID	2.6 ■	1.2	1.3	1.8	7.5 ■	2.9	1.3	1.2
Other Childhood Disorders	4.4 ■	1.6 ■	1.6 [■]	1.1	2.4 ■	1.5	1.3	1.0
Alcohol Misuse	1.6 ■	1.2 ■	1.1	1.1	1.0 ■	1.3	1.1 [*]	1.3
Drug Misuse	1.8 ■	1.4 ■	1.1	1.1	1.3 ■	1.5	1.1 [■]	1.1
NAPD	1.8 ■	1.3 ■	1.3 [■]	1.5	2.0 ■	1.5	1.1	0.6
Bipolar Disorder	2.1 ■	1.3 ■	1.3 [*]	1.5	1.7	1.4	1.0	0.9
Depression	2.0 ■	1.2 ■	1.1	1.0	1.4 ■	1.4 ■	1.1	1.1
Anxiety Disorders	1.7 ■	1.1 ■	1.1 [*]	1.1	1.4 ■	1.4 [*]	1.1	1.0
OCD	2.1 ■	1.3 [*]	1.0	- ^c	2.0 [*]	1.7	0.9	0.6
Stress Related Disorders	1.7 ■	1.1 ■	1.0	1.1	1.4 ■	1.3 [*]	1.2	1.0
Other Neurotic Disorders	1.5 ■	1.1 ■	1.1	0.9	1.5 ■	1.5	1.2 [*]	1.3
Eating Disorder	1.8 ■	1.1	0.7	1.1	0.9	1.0	1.2	1.1
Personality Disorder	2.7 ■	1.3 ■	1.1	1.2	1.8 ■	1.5 [*]	1.1	1.1
Neurologic								
Cerebral Palsy	1.1	0.8	1.3	1.9	2.2	0.7 [*]	0.7 [*]	0.9
Epilepsy	1.3 ■	1.1 ■	1.1	1.0	2.5 ■	1.7	0.9	1.5
Multiple Sclerosis	1.3	1.0	0.9	1.5	2.2	1.9	1.1	0.6
Migraine	1.3 ■	1.1 [*]	1.1	1.1	1.1 ■	1.0	1.0	1.2
Dementia	1.1	1.1 ■	1.1 [■]	1.2	1.1	1.2 ■	1.2	1.4
Stroke	- ^c	1.0	1.1	1.3	- ^c	1.3	0.7	1.0
Parkinson's Disease	- ^c	1.0	2.1	3.1	- ^c	- ^c	- ^c	- ^c

Abbreviations: ASD: autism spectrum disorders; ADHD: attention-deficit/hyperactivity disorder; ID: intellectual disability; NAPD: schizophrenia and other non-affective psychotic disorders; OCD: obsessive compulsive disorder; OR: odds ratio.

a. ORs with multiplicity-adjusted p-values < 0.0001 , $0.0001 - < 0.01$, and $0.01 - < 0.05$, were denoted with ■, ■, and ■, respectively. ORs with multiplicity-adjusted p-values ≥ 0.05 were not marked.

b. GS: Genetic similarity. GS 50% relatives included fathers, mothers and full-siblings; GS 25% relatives included grandparents, uncles, aunts and half-siblings; GS 12.5% relatives included half-uncles, half-aunts and first cousins; GS 6.25% relatives included half-cousins

c. OR could not be estimated due to low event rate.

